



## deep VIA etch

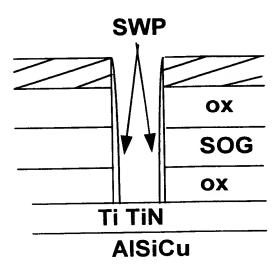


Figure 1: Schematic representation of deep via etch structure (not to scale)

## **Al-Overetched**

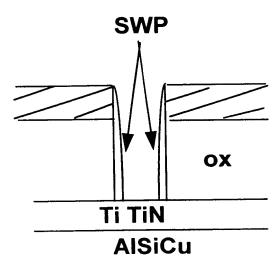


Figure 2: Schematic representation of Al overetched via structure (not to scale)





## Gasphase set-up

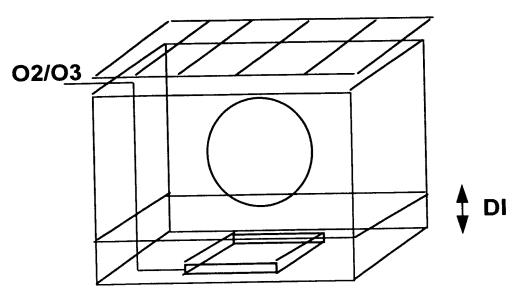


Figure 3: Moist gas-phase experimental set-up

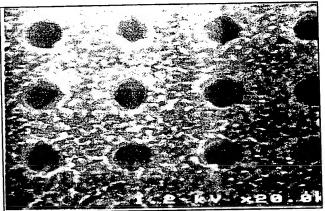


Figure 4: SEM micrograph of via structure prior to any cleaning treatment.



Figure 5: SEM micrograph after 45' O2 dry strip

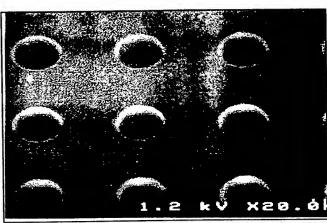


Figure 6: SEM micrograph of deep via (figure 1) after 10' exposure to moist ozone gasphase process with acetic acid spiking.

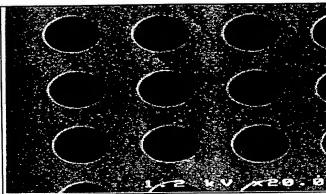


Figure 7: SEM micrograph of Al overetched via (figure 2) after 10' exposure to moist ozone gasphase process with acetic acid spiking.



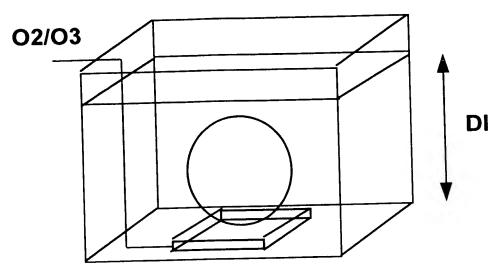


Figure 8: Ozone bubble immersion experimental set-up

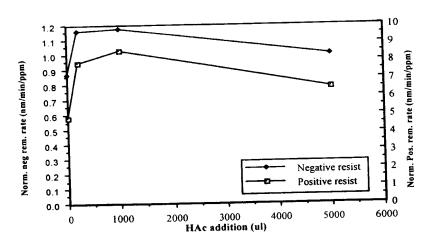


Figure 9: Resist removal process efficiency number (nm removal / process time \* ozone concentration) for positive and negative resist removal as a function of acetic acid concentration.

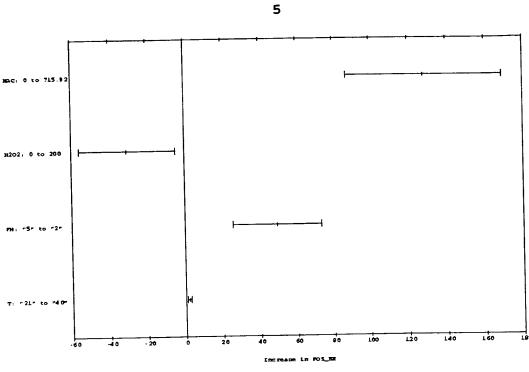
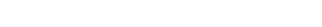


Figure 10: Main parameter effects on resist removal rate (nm removal / process time) for positive resist removal (with 95% confidence levels).



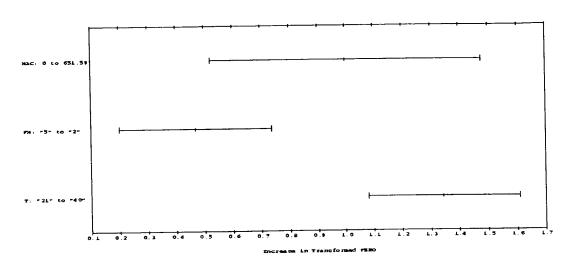


Figure 11: Main parameter effects on resist removal process efficiency number (nm removal / process time \* ozone concentration) for positive resist removal (with 95% confidence levels).

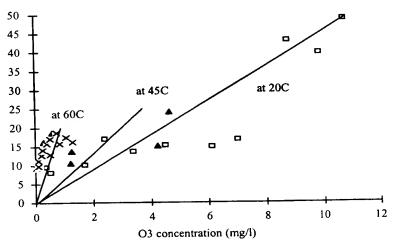


Figure 12: Resist removal efficiency as a function of temperature and ozone concentration for a static system.

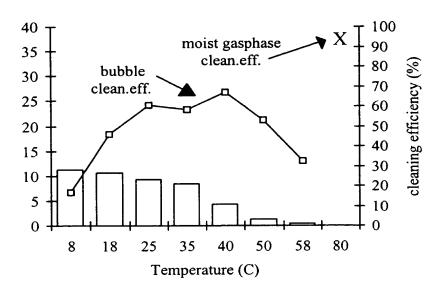


Figure 13 Resist removal efficiency as a function of temperature and ozone concentration for bubble and moist gasphase set-up.

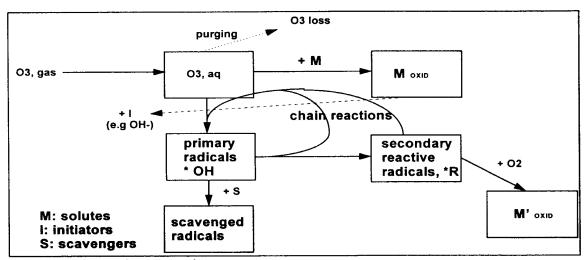


figure 14: Scheme of reactions of aqueous ozone.

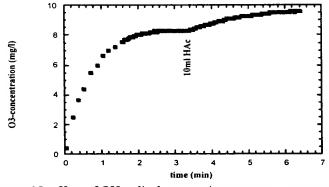


Figure 15: effect of OH radical scavenging on ozone concentration in a overflow tank.

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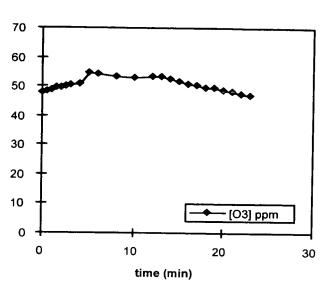


Figure 16: effect of repeated addition of  $H_2O_2$  (0.17mmol/l at t = 0, 13, 20, 24 min) to a DI water solution spiked with 0.23mmol/l of acetic acid.